

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
D. Wolin, et al.	:	Group Art Unit 2838
Serial No: 10/011,140	:	Examiner: Luk, Lawrence W.
Filed: 11/12/2001	:	Date: March 26, 2003
For: BATTERY CHARGING AND	:	
DISCHARGING SYSTEM ...	:	

AMENDMENT A

Commissioner of Patents
and Trademarks
Washington, D. C. 20231

Sir:

In response to the Office Action dated January 30, 2003, please amend the above-identified Application as follows and consider the accompanying remarks:

IN THE CLAIMS:

Please cancel Claims 7, 16, 24 and 32.

Please amend the remaining Claims as follows:

1. (Amended) An apparatus for charging a battery comprising
a charging circuit for providing a charging current to the battery;
a temperature sensor positioned to sense a temperature of said battery; and
a controller coupled to said temperature sensor and said charging circuit and
operable to control said charging circuit in accordance with said temperature, said

controller being operable to set said charging current to zero when said temperature is higher than a predetermined threshold value.

5. (Amended) The apparatus of Claim 1 wherein said controller is operable to set said charging current to a maximum value when said temperature is lower than a predetermined threshold value.

9. (Amended) An apparatus for exercising a battery, comprising
a charging circuit having a charging current output coupled to the battery;
a temperature sensor positioned to sense a temperature related to the battery temperature;
a discharging circuit having a discharging current input coupled to the battery; and
a controller coupled to said temperature sensor, said charging circuit, and said discharging circuit, said controller operable to set said charging current in accordance with said temperature, and operable to set said discharging current in accordance with said temperature, said controller being operable to set said discharging current to zero when said temperature is higher than a second predetermined threshold value.

15. (Amended) The apparatus of Claim 9 wherein said maximum value is the battery's maximum specified discharging current and said first predetermined threshold value is the battery's maximum discharging temperature.

18. (Amended) A method of charging a battery, comprising the steps of:
sensing a temperature related to the battery temperature;
setting a charging current in accordance with said sensed temperature and setting said charging current to zero when said temperature is higher than a predetermined threshold value; and
charging the battery at said charging current.

26. (Amended) A method of exercising a battery, comprising the steps of:
sensing a temperature related to the battery temperature;
setting a discharging current in accordance with said temperature;
discharging the battery at said discharging current;
discontinuing said discharging step when a predetermined battery voltage is reached;

setting a charging current in accordance with said temperature, said setting step further including the step of setting said discharging current to zero when said temperature is higher than a second predetermined threshold value; and
charging the battery at said charging current.

Please add the following new Claims:

-- 34. An apparatus for charging a battery comprising
a charging circuit for providing a charging current to the battery;
a temperature sensor positioned to sense a temperature of said battery; and
a controller coupled to said temperature sensor and said charging circuit and operable to control said charging circuit in accordance with said temperature, said controller being operable to set said charging current to a maximum value when said temperature is lower than a predetermined threshold value. --

-- 35. An apparatus for exercising a battery, comprising
a charging circuit having a charging current output coupled to the battery;
a temperature sensor positioned to sense a temperature related to the battery temperature;
a discharging circuit having a discharging current input coupled to the battery; and
a controller coupled to said temperature sensor, said charging circuit, and said discharging circuit, said controller operable to set said charging current in accordance with said temperature, and operable to set said discharging current in accordance with

said temperature, said controller being operable to set said discharging current to a maximum value when said temperature is lower than a predetermined threshold value. —

-- 36. The apparatus of Claim 35 and wherein said maximum value is the battery's maximum specified discharging current, and said first predetermined threshold value is the battery's maximum discharging temperature. --

-- 37. A method of exercising a battery, comprising the steps of:
sensing a temperature related to the battery temperature;
setting a discharging current in accordance with said temperature;
discharging the battery at said discharging current;
discontinuing said discharging step when a predetermined battery voltage is reached;

setting a charging current in accordance with said temperature, said setting step further including the step of setting said discharging current to a maximum value if said temperature is lower than a first predetermined threshold; and
charging the battery at said charging current. --

-- 38. The apparatus of Claim 37 and wherein said maximum value is the battery's maximum specified discharging current, and said first predetermined threshold value is the battery's maximum discharging temperature. --

REMARKS

Claims 1 - 33 are presently pending. In the above-identified Office Action, Claims 1, 8, 9, 17, 18, 25, 26 and 33 were rejected under 35 U.S.C. §102(e) as being anticipated by Podrazhansky *et al.* (U. S. Patent No. 6,366,056) hereinafter 'Podrazhansky'. Claims 2, 10, 19 and 27 were rejected under 35 U.S.C. § 103(a) as being anticipated by Podrazhansky in combination with Fujii (U.S. Patent No. 6,160,377). Claims 3, 11, 20 and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with Dunstan (U.S. Patent No. 5,572,110). Claims 4 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with Becker *et al.* (U.S. Patent No. 6,271,643). Claims 12, 13 and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with van Phuoc *et al.* (U.S. Patent No. 5,789,899). Claims 5, 6, 22 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with Pirdy (U.S. Patent No. 6,286,109).

Claims 7, 14 - 16, 24 and 30 - 32 were objected to as being dependent upon rejected base claims. These claims were indicated as being allowable if rewritten in independent form to include the limitations of the base claim.

Accordingly, by this Amendment, Applicants have amended Claim 1 to include the limitations of Claim 7, Claim 9 to include the limitations of Claim 16, Claim 18 to include the limitations of Claim 24, and Claim 26 to include the limitations of Claim 32. In addition, new Claims 34 - 38 for consideration. Claim 34 is an independent claim drawn along the lines of Claim 5. Likewise Claims 35 - 38 track Claims 14, 15, 30 and 31.

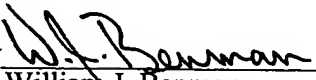
With the exception of Claim 34, all of the claims currently presented address the objections of the Examiner. Inasmuch as Claim 5 is similar to Claim 14, Claim 34 (drawn along the lines of Claim 5) should be allowable for the same reasons stated by the

Examiner for allowing Claim 14 if presented in independent form. That is, as stated by the Examiner:

“The prior art fails to teach or reasonably suggest that . .
the controller is operable to set said discharging current to
a maximum value when said temperature is low that a first
predetermined threshold value.”

Accordingly, Applicants respectfully submit that the subject application properly presents Claims patentable over the prior art. Accordingly, reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 7, 16, 24 and 32 have been canceled.

The remaining Claims have been amended as follows:

1. (Amended) An apparatus for charging a battery comprising
a charging circuit for providing a charging current to the battery;
a temperature sensor positioned to sense a temperature of said battery; and
a controller coupled to said temperature sensor and said charging circuit and
operable to control said charging circuit in accordance with said temperature, said
controller being operable to set said charging current to zero when said temperature is
higher than a predetermined threshold value.

5. (Amended) The apparatus of Claim 1 wherein said controller is operable to set
said charging current to a maximum value when said temperature is lower than a ~~first~~
predetermined threshold value.

9. (Amended) An apparatus for exercising a battery, comprising
a charging circuit having a charging current output coupled to the battery;
a temperature sensor positioned to sense a temperature related to the battery
temperature;
a discharging circuit having a discharging current input coupled to the battery; and
a controller coupled to said temperature sensor, said charging circuit, and said
discharging circuit, said controller operable to set said charging current in accordance
with said temperature, and operable to set said discharging current in accordance with

said temperature, said controller being operable to set said discharging current to zero when said temperature is higher than a second predetermined threshold value.

15. (Amended) The apparatus of Claim ~~14~~ and 9 wherein said maximum value is the battery's maximum specified discharging current; and said first predetermined threshold value is the battery's maximum discharging temperature.

18. (Amended) A method of charging a battery, comprising the steps of:
sensing a temperature related to the battery temperature;
setting a charging current in accordance with said sensed temperature and setting said charging current to zero when said temperature is higher than a predetermined threshold value; and
charging the battery at said charging current.

26. (Amended) A method of exercising a battery, comprising the steps of:
sensing a temperature related to the battery temperature;
setting a discharging current in accordance with said temperature;
discharging the battery at said discharging current;
discontinuing said discharging step when a predetermined battery voltage is reached;
setting a charging current in accordance with said temperature, said setting step further including the step of setting said discharging current to zero when said temperature is higher than a second predetermined threshold value; and
charging the battery at said charging current.

The following new Claims have been added:

34. An apparatus for charging a battery comprising a charging circuit for providing a charging current to the battery;

a temperature sensor positioned to sense a temperature of said battery; and
a controller coupled to said temperature sensor and said charging circuit and
operable to control said charging circuit in accordance with said temperature, said
controller being operable to set said charging current to a maximum value when said
temperature is lower than a predetermined threshold value.

35. An apparatus for exercising a battery, comprising
a charging circuit having a charging current output coupled to the battery;
a temperature sensor positioned to sense a temperature related to the battery
temperature;
a discharging circuit having a discharging current input coupled to the battery; and
a controller coupled to said temperature sensor, said charging circuit, and said
discharging circuit, said controller operable to set said charging current in accordance
with said temperature, and operable to set said discharging current in accordance with
said temperature, said controller being operable to set said discharging current to a
maximum value when said temperature is lower than a predetermined threshold value.

36. The apparatus of Claim 35 and wherein said maximum value is the battery's
maximum specified discharging current, and said first predetermined threshold value is
the battery's maximum discharging temperature.

37. A method of exercising a battery, comprising the steps of:
sensing a temperature related to the battery temperature;
setting a discharging current in accordance with said temperature;
discharging the battery at said discharging current;
discontinuing said discharging step when a predetermined battery voltage is
reached;

setting a charging current in accordance with said temperature, said setting step further including the step of setting said discharging current to a maximum value if said temperature is lower than a first predetermined threshold; and
charging the battery at said charging current.

38. The apparatus of Claim 37 and wherein said maximum value is the battery's maximum specified discharging current, and said first predetermined threshold value is the battery's maximum discharging temperature.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
D. Wolin, et al.	:	Group Art Unit 2838
Serial No. 10/011,140	:	Examiner: Luk, Lawrence W.
Filed: 11/12/2001	:	Date: May 30, 2003
For: BATTERY CHARGING AND	:	
DISCHARGING SYSTEM ...	:	

AMENDMENT B

Commissioner of Patents
P. O. Box 1450
Alexandria, CA 22313-1450

Sir:

In response to the Office Action dated May 6, 2003, please amend the above-identified Application as follows and consider the accompanying remarks:

IN THE CLAIMS:

Please amend the Claims as follows:

1. (Currently Amended) An apparatus for charging a battery comprising
a charging circuit for providing a charging current to the battery;
a temperature sensor positioned to sense a temperature of said battery; and
a controller coupled to said temperature sensor and said charging circuit and
operable to control said charging circuit in accordance with said temperature, said
controller being operable to set said charging current to zero when said temperature is
higher than a second predetermined threshold value.
2. (Original) The apparatus of Claim 1 wherein said controller continuously sets
said charging current in accordance with said temperature.
3. (Currently Amended) The apparatus of Claim 1 wherein said controller
periodically sets said charging current in accordance with said temperature.
4. (Original) The apparatus of Claim 1 further comprising a memory coupled to
said controller having a temperature and charging current look up table stored therein,
and wherein said controller accesses said look up table to set said charging current.
5. (Currently Amended) The apparatus of Claim 1 wherein said controller is
operable to set said charging current to a maximum value when said temperature is lower
than a first predetermined threshold value.

6. (Original) The apparatus of Claim 5 wherein said maximum value is the battery's maximum specified charging current, and said first predetermined threshold value is the battery's maximum charging temperature.

7. (Canceled)

8. (Original) The apparatus of Claim 1 wherein the battery is coupled to a load, and wherein said temperature sensor senses that temperature of the battery and the load.

9. (Previously Amended) An apparatus for exercising a battery, comprising
a charging circuit having a charging current output coupled to the battery;
a temperature sensor positioned to sense a temperature related to the battery temperature;

a discharging circuit having a discharging current input coupled to the battery; and
a controller coupled to said temperature sensor, said charging circuit, and said discharging circuit, said controller operable to set said charging current in accordance with said temperature, and operable to set said discharging current in accordance with said temperature, said controller being operable to set said discharging current to zero when said temperature is higher than a second predetermined threshold value.

10. (Original) The apparatus of Claim 9 and wherein said controller continuously sets said discharging current in accordance with said temperature.

11. (Currently Amended) The apparatus of Claim 9 and wherein said controller periodically sets said discharging current in accordance with said temperature.

12. (Original) The apparatus of Claim 9 further comprising a memory coupled to said controller having a temperature versus discharging current look up table stored

therein, and wherein said controller accesses said look up table to set said discharging current.

13. (Original) The apparatus of Claim 12 and wherein said discharging circuit comprises a variable impedance load and wherein said look up table values correspond to values of said variable impedance load.

14. (Original) The apparatus of Claim 9 and wherein said controller is operable to set said discharging current to a maximum value when said temperature is lower than a first predetermined threshold value.

15. (Previously Amended) The apparatus of Claim 9 wherein said maximum value is the battery's maximum specified discharging current and said first predetermined threshold value is the battery's maximum discharging temperature.

16. (Canceled)

17. (Original) The apparatus of Claim 9 wherein said temperature sensor senses the temperature of the battery and said discharging circuit.

18. (Currently Amended) A method of charging a battery, comprising the steps of:

sensing a temperature related to the battery temperature;

setting a charging current in accordance with said sensed temperature and setting said charging current to zero when said temperature is higher than a second predetermined threshold value; and

charging the battery at said charging current.

19. (Original) The method of Claim 18 and wherein said sensing and setting steps are repeated continuously during said charging step.

20. (Currently Amended) The method of Claim 18 and wherein said sensing and setting steps are repeated periodically during said charging step.

21. (Original) The method of Claim 18 and wherein said setting step further comprises the step of recalling a charging current corresponding to said sensed temperature from a look up table.

22. (Original) The method of Claim 18 and wherein set setting step includes setting said charging current to a maximum value if said temperature is lower than a first predetermined threshold.

23. (Original) The method of Claim 22 and wherein said maximum value is the battery's maximum specified charging current, and said first predetermined threshold is the battery's maximum charging temperature.

24. (Canceled)

25. (Original) The method of Claim 18 wherein the battery is coupled to a load, and wherein said sensing step includes sensing the temperature of the battery and the load.

26. (Previously Amended) A method of exercising a battery, comprising the steps of:

sensing a temperature related to the battery temperature;
setting a discharging current in accordance with said temperature;
discharging the battery at said discharging current;

discontinuing said discharging step when a predetermined battery voltage is reached;

setting a charging current in accordance with said temperature, said setting step further including the step of setting said discharging current to zero when said temperature is higher than a second predetermined threshold value; and

charging the battery at said charging current.

27. (Original) The method of Claim 26 and wherein said sensing and setting a discharge current steps are repeated continuously during said discharging step.

28. (Original) The method of Claim 26 and wherein said sensing and setting a discharge current steps are repeated periodically during said discharging step.

29. (Original) The method of Claim 26 and wherein said setting step further comprises the step of recalling a discharging current corresponding to said sensed temperature from a look up table.

30. (Original) The method of Claim 26 and wherein said setting step includes setting said discharging current to a maximum value if said temperature is lower than a first predetermined threshold.

31. (Original) The method of Claim 30 and wherein said maximum value is the battery's maximum specified discharging current, and said first predetermined threshold is the battery's maximum discharging temperature.

32. (Canceled)

33. (Original): The method of Claim 26 wherein the battery is coupled to a load, and wherein said sensing step includes sensing the temperature of the battery and the load.

34. (Canceled)

35. (Currently Amended): An apparatus for exercising a battery, comprising a charging circuit having a charging current output coupled to the battery; a temperature sensor positioned to sense a temperature related to the battery temperature;

a discharging circuit having a discharging current input coupled to the battery; and a controller coupled to said temperature sensor, said charging circuit, and said discharging circuit, said controller operable to set said charging current in accordance with said temperature, and operable to set said discharging current in accordance with said temperature, said controller being operable to set said discharging current to a maximum value when said temperature is lower than a first predetermined threshold value, said maximum value being the battery's maximum specified discharging current, and said first predetermined threshold value being the battery's maximum discharging temperature.

Claim 36 (Canceled)

37. (Currently Amended) A method of exercising a battery, comprising the steps of:

sensing a temperature related to the battery temperature;
setting a discharging current in accordance with said temperature;
discharging the battery at said discharging current;
discontinuing said discharging step when a predetermined battery voltage is reached;

setting a charging current in accordance with said temperature, said setting step further including the step of setting said discharging current to a maximum value if said temperature is lower than a first predetermined threshold, said maximum value being the battery's maximum specified discharging current, and said first predetermined threshold value being the battery's maximum discharging temperature; and
charging the battery at said charging current.

Claim 38. (Canceled)

REMARKS

Claims 1 – 6, 8, 18 – 23, 25, 35 and 37 are presently pending. In the above-identified Office Action, Claims 1, 8, 18, 25, 34, 35 and 37 were rejected under 35 U.S.C. §102(e) as being anticipated by Podrazhansky *et al.* (U. S. Patent No. 6,366,056) hereinafter ‘Podrazhansky’. Claims 2 and 19 were rejected under 35 U.S.C. § 103(a) as being anticipated by Podrazhansky in combination with Fujii (U.S. Patent No. 6,160,377). Claims 3 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with Dunstan (U.S. Patent No. 5,572,110). Claims 4 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with Becker *et al.* (U.S. Patent No. 6,271,643). Claims 5, 6, 22 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Podrazhansky in combination with Pirdy (U.S. Patent No. 6,286,109).

Claims 36 and 38 were objected to as being dependent upon rejected base claims. These claims were indicated as being allowable if rewritten in independent form to include the limitations of the base claim.

Claims 9 – 15, 17, 26 – 31 and 33 were allowed.


In the Office Action dated January 30, 2003, the Examiner indicated that Claims 7 and 24 would be allowable if presented in independent form to include the limitations of the base claim. In the response dated April 1, 2003, Applicants incorporated the limitations of Claim 7 into Claim 1 and Claim 24 into Claim 18 with the exception of the word “second” before “predetermined threshold value” to avoid adding confusion inasmuch as Claims 1 and 18 did not recite a “first predetermined threshold value”. However, in the present Action, the Examiner has made it clear that the “second” limitation is significant with respect to the allowability of the claim. Accordingly, by this Amendment, Applicants have amended Claims 1 and 18 to include the “second predetermined threshold value” limitations of Claim 7 and Claim 24, respectively.

Accordingly, Claims 1, 18 and the claims dependent thereon should now be allowable as well.

Further, Claim 35 has been amended to include the limitation of Claim 36. Claim 37 has been amended to include the limitation of Claim 38. Claims 35 and 37 should be therefore allowable as well. Claims 34, 36 and 38 have been canceled.

Accordingly, Applicants respectfully submit that the subject application properly presents Claims patentable over the prior art. Accordingly, reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
D. Wolin, et al.

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